Influenza Vaccination in Healthcare Personnel

Ying “Mai” Kung
DNP, MPH, FNP-BC
Bio for Mai Kung

Disclosure Information: None to disclose

* FNP for over 20 years & RN for over 30
* DNP from University of Florida
* Post-master’s Nurse Educator Certificate from Florida State University
* MN & MPH from Emory University
* BSN from University of Texas at Austin

* Full-time Faculty at Florida State University College of Nursing
* President of Tallahassee Area Council of Advanced Practice Nurses
* Blog author for ADVANCE for NPs & PAs: DNP Answers
* 2010 University of Florida DNP Academic Excellence Award recipient
* Research interest: improving patients’ access to safe, high-quality healthcare
Purpose & Outline

Purpose:
- Share the process & results of my DNP project aimed to increase influenza vaccination in HCP at a university health center

Outline
- Overview of influenza & importance of vaccination
- QI project
By the end of this presentation the participants will be able to:

* Identify the Healthy People 2020 Objective on HCP influenza vaccination.

* Name 2 common facilitators and barriers to HCP influenza vaccine uptake.

* Name 2 most effective interventions to improve influenza vaccine uptake found in this study.
Flu Facts

Epidemiology

* Infects 5-20% of population per year
* Influenza and pneumonia:
  * 8th leading cause of death
* >200,000 hospitalizations per year
* 3,000-49,000 (2003-2004 season) deaths per year
* Financial impact about 37.5 billion per year
Flu Facts

Signs and Symptoms

Fever
HA
Body aches
Fatigue
Cough
Rhinorrhea
Sore throat
N/V/D

Note that some persons may have atypical presentations.
Flu Facts

Transmission

* How it is transmitted
  * Coughing, sneezing...
  * Touching a contaminated surface then touching mouth or nose

* Transmit/infect others when you have no symptoms
  * Start the day before you are sick
    * Healthy adults: continue shedding for 3-5 days
    * Kids: continue shedding for 10 or more days
    * Immunocompromised: can shed viruses for weeks or months
    * LAIV: can potentially shed virus after vaccination
Flu Facts

Transmission

- Randomized, prospective, double-blind, controlled trial over 3 influenza seasons at 2 hospitals (Wilde et al., 1999):
  - 7 – 26% of unvaccinated HCP had serologic evidence of influenza infection
  - 42% could not recall having a febrile illness
- Surveyed 1000 nurses in a large tertiary hospital & 513 completed this survey (Ofstead et al., 2008):
  - 78.4% respondents had influenza-like illness in the past year
  - 81.8% of them worked while ill
- Incubational period 1-7 days, average of 2 days
**Type A:** Most virulent/Pandemics
- Subtyped based on surface glycoproteins
  - Hemagglutinin (HA): H1, H2, H3, H5
  - Neuraminidase (NA): N1, N2
    - Seasonal Flu: H1N1 & H3N2 (greatest morbidity)
    - 2009 H1N1: swine (S-OIV), pandemic, novel H1N1
    - Avian (Bird) flu: H5N1

**Type B:** Less virulent/less rapid antigenic drift
- Yamagata lineage
- Victoria lineage

**Type C:** Rarely causes significant influenza like illnesses (ILI)
## Antiviral Resistance/Susceptibility

### Flu Facts

#### 2008-2012

<table>
<thead>
<tr>
<th></th>
<th>Neuraminidase Inhibitors (NI)</th>
<th>Adamantanes (M2 Channel Inhibitors)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Oseltamivir (Tamiflu)</td>
<td>Zanamivir (Relenza)</td>
</tr>
<tr>
<td>Influenza A</td>
<td></td>
<td>Amantadine (Symmetrel)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rimantadine (Flumadine)</td>
</tr>
<tr>
<td>Seasonal H1N1 (2008-2009)</td>
<td>R</td>
<td>S</td>
</tr>
<tr>
<td></td>
<td></td>
<td>S</td>
</tr>
<tr>
<td>Seasonal H3N2 (2008-2012)</td>
<td>S</td>
<td>S</td>
</tr>
<tr>
<td></td>
<td></td>
<td>R</td>
</tr>
<tr>
<td>2009 H1N1 (2009-2012)</td>
<td>S</td>
<td>S</td>
</tr>
<tr>
<td></td>
<td></td>
<td>R</td>
</tr>
<tr>
<td>Influenza B (2008-2012)</td>
<td>S</td>
<td>S</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Not indicated</td>
</tr>
</tbody>
</table>

**R** = Resistant  
**S** = Susceptible
Flu Activity & Surveillance

FluView

A Weekly Influenza Surveillance Report Prepared by the Influenza Division
Weekly Influenza Activity Estimates Reported by State and Territorial Epidemiologists*

Week Ending May 19, 2012 - Week 20

*This map indicates geographic spread and does not measure the severity of influenza activity.

http://www.cdc.gov/flu/weekly/usmap.htm
Pneumonia and Influenza Mortality for 122 U.S. Cities
Week Ending June 30, 2012
Number of Influenza-Associated Pediatric Deaths by Week of Death: 2008-09 season to present

- **2008-09**: Number of Deaths Reported = 133
- **2009-10**: Number of Deaths Reported = 282
- **2010-11**: Number of Deaths Reported = 122
- **2011-12**: Number of Deaths Reported = 31
## Influenza Diagnostic Tests

<table>
<thead>
<tr>
<th>Test Type</th>
<th>Time</th>
<th>ID Viral Type</th>
<th>ID Viral Subtypes</th>
<th>Sensitivity</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Culture</td>
<td>3-10 days</td>
<td>Yes</td>
<td>Yes</td>
<td>Gold Standard</td>
<td>Not widely available</td>
</tr>
<tr>
<td>Rapid Cell Culture</td>
<td>1-3 days</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RT-PCR</td>
<td>1-6 hrs</td>
<td>Yes</td>
<td>Yes</td>
<td>86-100%</td>
<td>Gold Standard</td>
</tr>
<tr>
<td>DFA or IFA</td>
<td>1-4 hrs</td>
<td>Yes</td>
<td>No</td>
<td>47-97%</td>
<td>Require technical expertise to perform</td>
</tr>
<tr>
<td>RIDT</td>
<td>≤ 30 mins</td>
<td>Varies</td>
<td>No</td>
<td>10-70%</td>
<td>“+” test: rule in flu, “-” test: unable to rule out flu</td>
</tr>
<tr>
<td>Serology</td>
<td>2+ wks</td>
<td>NA</td>
<td>NA</td>
<td>Lack of standard</td>
<td>Generally not recommended, paired testing 2-3 wks apart, “+” test: ≥ 4 fold increase</td>
</tr>
</tbody>
</table>
Safe, most effective way to prevent influenza
Requires yearly vaccination
Prevent transmission to patients, coworkers and families
3 strains of viruses (2 A & 1 B) identified by the FDA, WHO, CDC and others as to most likely to cause illness
Becomes effective 2 weeks after receiving vaccine
Flu Vaccine Facts

Effectiveness

* Healthy immune system → more effective
* When well matched:
  * 50-90% effective in healthy adults <65 year olds
* When less well matched:
  * 47-77% effective
  * 90% effective in preventing hospitalization in healthy adults

* Elderly & people with chronic medical condition:
  * 30-70% prevent pneumonia or hospitalization
* Nursing home residents
  * 50-60% from pneumonia or hospitalization
  * 80% from death
Benefits of HCP Vaccination

* Herd immunity
* Higher vaccination level → lower risk of nosocomial flu cases
* Vaccinated hospital HCP were less likely to report influenza-like-illness than unvaccinated HCP → reduced absenteeism
* Staff vaccinations in nursing home
  * 5 vaccinations → prevent one ILI (influenza like illness)
  * 6 vaccinations → prevent 1 ILI practitioner consultation
  * 8 vaccinations → prevent 1 death
  * 20 vaccinations → prevent 1 ILI hospital admission
Side Effects of Flu Vaccines

Flu Shot (TIV)
Inactivated Viruses
Indicated for anyone ≥ 6 months

* Soreness, redness, or swelling at injection site
* Fever (low grade)
* Aches
* Occurs right after the shot and lasts 1-2 days
Side Effects of Flu Vaccines

FluMist

* Runny nose
* Headache
* Sore throat
* Cough
* Wheezing**
* Vomiting**
* Muscle aches**
* Fever**

Live Attenuated (Weakened) Viruses
Indicated for non-pregnant women ages 2-49

Intranasal flu vaccine being administered to a child.
(Source: MedImmune Inc.)

**in children
Intradermal Flu Vaccine (ID)

* “Fluzone Intradermal®” became available in 2011-2012
* Smaller dose of antigen (40% less)
* Smaller needles (0.06 in or 1.5 mm)
* Preservative-free (no thimerosal)
* Indicated for ages 18-64
* Common SE: mild
  * Redness, swelling, toughness, pain, and itching at the injection site (subsides within 3-7 days)
  * Headache, muscle ache, and tiredness
Fluzone High-Dose (IM)

- Approved in 2009
- Contains 4x’s amount of antigen
- For Ages 65 and over
- Higher immune response
- Safety profile similar to seasonal TIV
- Common adverse events:
  - Pain, redness and swelling at the injection site
  - Headache, muscle aches, fever and malaise
Who Should Not Receive Flu Vaccine

- Severe allergy to chicken eggs
- Severe reaction to an influenza vaccination
- Developed Guillain-Barré syndrome (GBS) within 6 weeks of getting an influenza vaccine (less than 1 in a million)
- Children less than 6 months of age
- People with moderate-to-severe illness with a fever (they should wait until they recover to get vaccinated)
Reasons for Flu-Like Symptoms After Vaccination

“Prior Bad Experience”

- Exposed to flu virus right before or within 2 wks of vaccination
- Sick from other (non-flu) viruses
- Exposed to a different flu virus not included in the vaccine
- Some do not develop protection from vaccination related to weakened immune systems
Reasons for Influenza Vaccination

- Protection from flu
- Stop the transmission of flu
- Limitation in diagnostic testing
- Antiviral resistance
- Pandemic situation - may not have enough medications to go around

Flu doesn’t fight fair.
Even if you’re healthy, you can get sick and spread the flu to your co-workers, patients, or even bring it home to your family.

Fight back.
DON’T GET THE FLU, DON’T SPREAD THE FLU, GET VACCINATED.

FOR MORE INFORMATION 800-CDC-INFO
Self-Reported Influenza Vaccination Coverage Levels Among Selected Priority U.S. Populations, 1995-2008, National Health Interview Survey

Year

Coverage Level (%)

Vaccine shortage: 2004-05 season

<table>
<thead>
<tr>
<th>Goal</th>
<th>Actual HCP Vaccination Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Healthy People 2010 Objective</td>
<td>&lt;50% before 2008</td>
</tr>
<tr>
<td></td>
<td>52.9% 2008-2009</td>
</tr>
<tr>
<td></td>
<td>61.9% 2009-2010</td>
</tr>
<tr>
<td>Health People 2020 Objective</td>
<td>63.5% 2010-2011</td>
</tr>
<tr>
<td>Flu Vaccine Recommendation</td>
<td></td>
</tr>
<tr>
<td>For HCP Since 1984</td>
<td></td>
</tr>
</tbody>
</table>
The Joint Commission requires all critical access hospital, hospital, and long-term care accreditation programs to provide influenza vaccine to all staff, volunteers, and independent licensed practitioners (2007).

CMS requires acute care hospitals to report HCP immunization rate as part of the Hospital Inpatient Quality Report Program beginning in Jan. 2013.

* 2% payment reduction if failed to report
State University student health center located in the southeastern U.S.

- # of employees: ≈115
- Student population: ≈41,000
- Annual visits to the health center: ≈78,000

A champion in raising awareness of the importance of influenza vaccination for the university students and staff since 2000
Purpose of Study

* QI project aimed to increase HCP influenza vaccination rate

* Questions:
  * What is the baseline HCP influenza vaccination rate?
  * What are facilitators for vaccine uptake?
  * What are barriers to vaccine uptake?
  * What interventions are most likely to improve HCP vaccination rate?
  * How effective are planned interventions to improve HCP vaccination rate?
Evidence Based Practice

PICO Statements

* P: Patient, Population, or Problem
  * Increase HCP influenza vaccination rate
  * Measure HCP influenza vaccination rates
  * Identify perceived facilitators and barriers to vaccine uptake

* I: Intervention
  * Plan and implement specific interventions to increase vaccination rate

* C: Comparison
  * Before and after intervention

* O: Outcome
  * HCP influenza vaccination rate
  * Intervention effectiveness
Method

* Target population:
  * All employees (paid or unpaid) ages 18-64
* Cross-sectional descriptive study design
* Pre-intervention survey: Assess baseline vaccination rate & perceptions
  * Development of survey instrument: Spring semester of 2009 (Plan)
  * IRB proposals: approved by 2 universities March 2009 (Plan)
  * Survey administration: May 1 – June 1, 2009 (Do)
* Analyzed pre-intervention survey data *(Study)*
* Planned interventions *(Plan)*
* Presented information & recommendations to administrators for approval *(Plan)*
  * June to August, 2009*
* Implemented interventions *(Act)*
  * Aug. 2009 through 2010 influenza season*
Method (con’t)

* Post-intervention survey
  * Modified post-intervention survey to reflect changes (Plan)
  * Submitted addendum to IRB: Approved in Oct. & Nov. 2009 (Plan)
  * Administered survey between Jan. 4 and Feb. 4, 2010 (Do)

* Data analysis for post-intervention survey & compared with pre-intervention survey data (Study)

* Recommendation and dissemination of results (Act)
## Survey Instruments

<table>
<thead>
<tr>
<th></th>
<th>Pre-Intervention</th>
<th>Post-Intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demographics</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Influenza vaccination status</td>
<td>2007-2008</td>
<td>2008-2009</td>
</tr>
<tr>
<td></td>
<td>2008-2009</td>
<td>2009-2010</td>
</tr>
<tr>
<td>19 Facilitators variables</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>21 Barrier variables</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Knowledge &amp; attitudes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Effectiveness of interventions</td>
<td>x</td>
<td>Yes</td>
</tr>
<tr>
<td>Impact of 2009 H1N1 epidemic</td>
<td>x</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Surveys were designed with permission from Dr. Anne Cowan & from Dr. Kristin Nichol & Dr. Kim Lipczynski and pilot tested.
# Pre-Intervention Survey Results

**Demographics**

Administered May 1 – June 1, 2009

<table>
<thead>
<tr>
<th></th>
<th>Pre-Intervention Survey</th>
</tr>
</thead>
<tbody>
<tr>
<td>Response rate</td>
<td>( N = 91 ) (78%)</td>
</tr>
<tr>
<td>Age 45-64</td>
<td>( n = 53 ) (59%)</td>
</tr>
<tr>
<td>Caucasian</td>
<td>( n = 58 ) (69%)</td>
</tr>
<tr>
<td>Female</td>
<td>( n = 79 ) (88%)</td>
</tr>
<tr>
<td>Clinical staff</td>
<td>( n = 57 ) (67%)</td>
</tr>
<tr>
<td>Worked 30+ hrs per wk</td>
<td>( n = 83 ) (93%)</td>
</tr>
<tr>
<td>30+ hrs of direct pt contact per wk</td>
<td>( n = 42 ) (48%)</td>
</tr>
</tbody>
</table>
Vaccination rates:

* 2007-2008 = 72.2%
* 2008-2009 = 75.6%

All vaccinated respondents reported receiving a TIV (flu shot)

* 96% (65/68 people) vaccinated received a flu vaccine at work
What are some of the main reasons that would prompt you to receive a flu vaccine?

Facilitators
(check all that apply)

- Flu vaccine is recommended
  - By experts in the field (i.e. CDC)
  - By my supervisor/administrator
  - By my healthcare provider
  - By my co-workers
  - Others

- Influenced by others who received flu vaccination
  - Supervisor/administrator
  - Healthcare providers
  - Co-workers
  - Family members
  - Other _________________

- I consider myself at risk (due to age, health, sick friends or family)
- Protect myself and my family from the illness
- Protect patients from illness
- The vaccine will reduce absenteeism at work
- The vaccination process/procedure/location is (are) convenient.
- The vaccine is free and provided by my employer
- High healthcare workers vaccination rate shows high quality of care for the patients/it is part of the quality improvement (QI) process at work
- Required by work
- Others, please specify
### Pre-Intervention Survey Results

<table>
<thead>
<tr>
<th></th>
<th>Facilitators</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Desire to protect self/family</td>
<td>66%</td>
</tr>
<tr>
<td>2</td>
<td>Free vaccine</td>
<td>65%</td>
</tr>
<tr>
<td>3</td>
<td>Vaccine is recommended by experts</td>
<td>58%</td>
</tr>
<tr>
<td>4</td>
<td>Vaccination process is convenient</td>
<td>48%</td>
</tr>
<tr>
<td>5</td>
<td>Desire to protect patient</td>
<td>45%</td>
</tr>
<tr>
<td>6</td>
<td>Recommended by my healthcare provider</td>
<td>41%</td>
</tr>
</tbody>
</table>
What are the main reasons that you, personally, might NOT get a flu vaccine?

Barriers
(check all that apply)

- No reason, I get it regularly
- Not required/not needed/healthy
- Only for older adults/seniors
- Not concerned about getting flu/won’t happen to me
- Limited contact with high risk patients
- Shortage of flu vaccine
- Not in priority group/others need it more
- Vaccine not effective/doesn’t cover all strains of flu
- Too busy/forgot
- Not convenient/too much trouble
- Prior bad experience
- Cost too much
- Concerned that vaccine will make me sick/side effects of vaccine
- Dislike needles
- Allergy to flu vaccine/allergy to egg
- Against my religion
- My health care provider has not recommended that I receive the vaccine
- Don't know when the best time to get the vaccine
- The vaccine is not available to me
- I receive the vaccine in the previous flu season(s); therefore, I don't need it
- Other, please specify
## Pre-Intervention Survey Result

<table>
<thead>
<tr>
<th></th>
<th>Barriers</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Concerned about vaccine side effects</td>
<td>22%</td>
</tr>
<tr>
<td>2</td>
<td>Not in priority group/others need it more</td>
<td>13%</td>
</tr>
<tr>
<td>3</td>
<td>Not required/not needed/healthy</td>
<td>11%</td>
</tr>
<tr>
<td>4</td>
<td>Too Busy/forgot</td>
<td>9%</td>
</tr>
<tr>
<td>5</td>
<td>Prior bad experience</td>
<td>9%</td>
</tr>
<tr>
<td>6</td>
<td>Shortage of flu vaccine</td>
<td>8%</td>
</tr>
</tbody>
</table>
## Evidence Based Practice

<table>
<thead>
<tr>
<th>Level of Evidence</th>
<th>CDC, ACIP, HICPAC Recommendation Use in Combination</th>
</tr>
</thead>
<tbody>
<tr>
<td>IA</td>
<td>Flu vaccine to all HCP annually</td>
</tr>
<tr>
<td>IB</td>
<td>Free flu vaccine &amp; convenient process</td>
</tr>
<tr>
<td>IB</td>
<td>Educate on benefits of vaccine &amp; risks/sequelae of illnesses</td>
</tr>
<tr>
<td>IB</td>
<td>Monitor flu vaccination &amp; declination at regular intervals Provide feedback to staff</td>
</tr>
<tr>
<td>II</td>
<td>Obtain signed declination form</td>
</tr>
<tr>
<td>II</td>
<td>Use vaccination rates as an indicator for healthcare quality and safety</td>
</tr>
</tbody>
</table>
Intervention #1

Variables Influenced Behavior

- Recommended by experts & their HCP
- Protect self, family & pt
- Concerned about SE
- Prior bad experience
- Not needed/healthy
- Not in priority group/ others need it more

Intervention

- Delivered by a recorded PP presentation
- Available on the intranet
- Voluntary participation
- Employees watched on their own time

Education on Influenza & Vaccine
Intervention #2 & 3

Variables Influenced Behavior:

* Vaccine is free
* Vaccination process is convenient
* Too busy

#2: Continue to provide free influenza vaccine

#3: More convenient vaccination procedure

* Old procedure: appt. with employee health nurse
* New procedure: mobile cart
  * Available on each floor
  * Available any time during operating hours
Adoption of a declination form

- Required for employees who did not receive a flu vaccine at work
- Self-reporting of vaccine status
- Better tracking of vaccine uptake by employees
### Survey Results

#### Demographics

<table>
<thead>
<tr>
<th></th>
<th>Pre-Intervention Survey</th>
<th>Post-Intervention Survey</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Response rate</strong></td>
<td>N = 91 (79%)</td>
<td>N = 62 (53%)</td>
</tr>
<tr>
<td><strong>Age 45-64</strong></td>
<td>n = 53 (59%)</td>
<td>n = 48 (77%)</td>
</tr>
<tr>
<td><strong>Caucasian</strong></td>
<td>n = 58 (69%)</td>
<td>n = 40 (66%)</td>
</tr>
<tr>
<td><strong>Female</strong></td>
<td>n = 79 (88%)</td>
<td>n = 53 (86%)</td>
</tr>
<tr>
<td><strong>Clinical staff</strong></td>
<td>n = 57 (67%)</td>
<td>n = 41 (71%)</td>
</tr>
<tr>
<td><strong>Worked 30+ hrs per wk</strong></td>
<td>n = 83 (93%)</td>
<td>n = 58 (94%)</td>
</tr>
<tr>
<td><strong>30+ hrs of direct pt contact per wk</strong></td>
<td>n = 42 (48%)</td>
<td>n = 30 (48%)</td>
</tr>
</tbody>
</table>

*80% of respondents in the post-intervention survey also participated in the pre-intervention survey*
## Survey Results

### HCP Vaccination Rate

<table>
<thead>
<tr>
<th></th>
<th>Pre-Intervention Survey 2009</th>
<th>Post-Intervention Survey 2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vaccination rate:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The year before the survey</td>
<td>72.2% (2007-2008)</td>
<td>70.7% (2008-2009)</td>
</tr>
<tr>
<td>Vaccination rate:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The year of the survey</td>
<td>75.6% (2008-2009)</td>
<td>77.4% (2009-2010)</td>
</tr>
<tr>
<td>% Change</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3.4%</td>
<td>6.4%</td>
</tr>
<tr>
<td>Statistics</td>
<td>Chi Square Test (n = 90)</td>
<td>Fisher Exact Test (n = 58)</td>
</tr>
<tr>
<td></td>
<td>(p = .001)</td>
<td>(p = .001)</td>
</tr>
<tr>
<td>Received at work</td>
<td>96% (65 out of 68)</td>
<td>96% (47 out of 49)</td>
</tr>
</tbody>
</table>

100% of those received an influenza vaccine received a TIV.
## Survey Results

**Top 6 of 19 Variables**

<table>
<thead>
<tr>
<th></th>
<th>Pre-Intervention Survey</th>
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<tbody>
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<td>1</td>
<td>Desire to protect self/family (66%)</td>
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<td>Vaccine process is convenient (48%)</td>
<td>Vaccine process is convenient (52%)</td>
</tr>
<tr>
<td>5</td>
<td>Desire to protect patient (45%)</td>
<td>Reduce absenteeism (47%)</td>
</tr>
<tr>
<td>6</td>
<td>Recommended by my healthcare provider (41%)</td>
<td>Desire to protect patient (45%)</td>
</tr>
</tbody>
</table>
## Survey Results

### Top 6 of 21 Variables

<table>
<thead>
<tr>
<th></th>
<th>Pre-Intervention Survey</th>
<th>Post-Intervention Survey</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Concerned about vaccine side effects (22%)</td>
<td>Concerned about vaccine side effects (19%)</td>
</tr>
<tr>
<td>2</td>
<td>Not in priority group/others need it more (13%)</td>
<td>Dislike needles (10%)</td>
</tr>
<tr>
<td>3</td>
<td>Not required/not needed/healthy (11%)</td>
<td>Not required/not needed/healthy (8%)</td>
</tr>
<tr>
<td>4</td>
<td>Too Busy/forgot (9%)</td>
<td>Too busy/forgot (8%)</td>
</tr>
<tr>
<td>5</td>
<td>Prior bad experience (9%)</td>
<td>Shortage of flu vaccine (8%)</td>
</tr>
<tr>
<td>6</td>
<td>Shortage of flu vaccine (8%)</td>
<td>Vaccine not effective (6%)</td>
</tr>
</tbody>
</table>
Discussion & Implication

Consistent With Existing Literature

Barriers

* Fear of SE
* Insufficient time
* Inconvenience
* Cost of vaccination
* Fear of needles
* Perceived low risk for influenza infection

Facilitators

* Protect self, family, patient
* Free vaccination
* Convenient vaccination process
# Survey Results

## Intervention Effectiveness

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Rating of 4 or 5*</th>
<th>Correlation with Vaccine Uptake in 2009-2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Free Vaccine</td>
<td>89%</td>
<td>$r = .557, p = .001$</td>
</tr>
<tr>
<td>Convenient Process</td>
<td>80%</td>
<td>$r = .321, p = .016$</td>
</tr>
<tr>
<td>Education</td>
<td>59%</td>
<td>$r = .047, p = .404$</td>
</tr>
<tr>
<td>Declination Form</td>
<td>40%</td>
<td>$r = .159, p = .209$</td>
</tr>
</tbody>
</table>

*Likert scale rating 1 (ineffective) to 5 (effective)
Implementation of concurrent, multi-faceted interventions are more effective than single modality.

Free & Convenient: Providing free vaccination with convenient vaccination location and procedure were highly associated with increased vaccination rates.

Education: Not necessarily ensure vaccine uptake.
- Only half of the respondents completed the education program.
- Suggest: Face-to-face encounters & opportunity to ask questions.

Declination Form: not predictive of vaccination rates, but associated with higher vaccination rate in institutions that required one.

Consistent With Existing Literature
FluView
A Weekly Influenza Surveillance Report Prepared by the Influenza Division


Week

% of Visits for ILI

200840 200850 200910 200920 200930 200940 200950 201010 201020 201030 201040 201050 201110 201120 201130 201140 201150 201210 201220

% ILI National Baseline
2009 H1N1 Epidemic

An Unanticipated Event

- Potentially Increased Vaccine Uptake
  - Fear of influenza infection
  - Desire to be protected from influenza infection
  - Felt more pressure to be vaccinated
Potentially Decreased Vaccine Uptake

- 2 influenza vaccines (2009-2010 season): Seasonal trivalent & 2009 H1N1 monovalent vaccines
- Resources diverted for the manufacturing of 2009 H1N1 vaccine
- Shortage for seasonal influenza vaccine
  - HCPs declined vaccines so higher risk patients may have access
  - Harris (2010) estimated 7% HCP named unavailability of vaccine as a reason for not receiving a seasonal vaccine
- 2009 H1N1 was the dominating circulating subtype
  - Not covered by seasonal trivalent influenza vaccines
The novel H1N1 flu affected my decision:

1. To receive a SEASONAL flu vaccine: $n = 9, 18\%$
2. Not to receive a SEASONAL flu vaccine: $n = 5, 6\%$
3. My decision to receive Seasonal flu vaccine is not affected by the novel H1N1 flu: $n = 38, 76\%$
Limitations

* Self reported vaccination and opinions
* Small sample size and poor response rate on the post-survey (n = 62, 53%)
* Selection bias: convenient samples
* Difficult to assess the true impact of the 2009 H1N1 pandemic on the outcomes
Summary

- Influenza causes significant morbidity & mortality
- Expert recommend for **ALL** HCP to be vaccinated
- Health People 2020 goal for HCP vaccination is 90%
- QI project → increased vaccination uptake
- Facilitators & barriers to HCP vaccine uptake were consistent with literature
- Most effective Interventions: Free & Convenient
- QI project over a span of 18 months
Future Implications

- **Available**: Offer free vaccine to all HCP regardless of their job title or pay status
- **Accessible**: Offer convenient vaccination process
  - Time, mobile cart, no need to leave their work station
- **Education**: Part of the employees’ work assignment
  - Face-to-face sessions & ability to ask questions
  - Targeted for knowledge level & vaccination history
- **Understanding specific characteristics associated with vaccine uptake & declination**
- **May need to entertain mandatory vaccine policy**
References

References

References

- National Vaccine Advisory Committee (NVAC) Adult Immunization Working Group, Health Care Personnel Influenza Vaccination Subgroup (2011, December 15). *Recommendations on strategies to achieve the healthy people 2020 annual goal of 90% influenza vaccine coverage for health care personnel-Draft.*
References


Thank You!

VACCINATE AGAINST FLU

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Extra Slides
On February 23, 2012 the WHO recommended that the Northern Hemisphere's 2012-2013 seasonal influenza vaccine be made from the following three vaccine viruses:

* an A/California/7/2009 (H1N1)pdm09-like virus (same in 2011-2012 vaccine)
* an A/Victoria/361/2011 (H3N2)-like virus (different than 2011-2012 vaccine)
* a B/Wisconsin/1/2010-like virus from the B/Yamagata lineage of viruses (Different than 2011-2012 vaccine)
Characteristics of 2009 H1N1 Influenza
April 15, 2009 to April 10, 2010

Cases: 61,000,000
Hospitalizations: 274,000
Deaths: 12,470

Approximate Rate per 100,000 population:
- 0-4: 4
- 5-24: 25
- 25-49: 50
- 50-64: 64
- ≥65: 24

Presentation: “2009 H1N1: Overview of a Pandemic, April 2009-August 2010” Available at http://www.cdc.gov/h1n1flu/yearinreview.htm